

# System Requirements for Online Testing

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This document contains basic technology requirements for online testing using American Institutes for Research's (AIR) systems for the 2015–2016 test administration. This document contains the following sections:

- [Supported Operating Systems for Student Testing](#)
- [Supported Web Browsers for Online Systems](#)
- [Requirements for Peripheral Equipment](#)

The following publications provide additional information:

- For information about installing secure browsers, refer to the *Secure Browser Installation Manual*.
- For information about network and Internet requirements, general peripheral and software requirements, and configuring text-to-speech settings, see the *Technical Specifications Manual for Online Testing*.
- For information about securing a computer before a test session, see the *Test Administrator User Guide*.
- For information about supported hardware and software for Braille testing as well as information about configuring JAWS, refer to the *Braille Requirements and Testing Manual*.
- The above resources, as well as secure browsers and user guides for other systems, are available on the Montana Comprehensive Assessment System portal (<http://mt.portal.airast.org>).

## Supported Operating Systems for Student Testing

This section describes the supported operating systems for online testing.



### **Warning: Support for New Desktop Operating Systems**

Operating systems that become available but do not appear in the following tables are not supported. Do not upgrade to new operating systems on computers that will be used to administer online assessments without ensuring the updates meet the required specifications.

## Desktops and Laptops

[Table 1](#) lists the operating systems and hardware required for student testing. Online testing functions effectively with the minimum requirements listed. However, the recommended specifications provide improved performance.

Table 1. Supported Desktop Operating Systems

Supported Operating Systems	Minimum Requirements	Recommended Specifications
<b>Windows</b> XP (Service Pack 3), Vista, 7, 8.0 (Professional), 8.1, 10 (Educational and Professional) Server 2003, 2008, 2012 (thin client)	Pentium 4 or newer processor that supports SSE2 512 MB of RAM 200 MB hard drive space	Pentium 4 or newer processor that supports SSE2 2 GB+ RAM 80 GB+ hard drive
<b>Mac OS X (Intel)*</b> 10.5	Intel x86 processor 512 MB of RAM 200 MB hard drive space	1 GHz or faster processor 1 GB+ RAM 80+ GB hard drive
<b>Mac OS X (Intel)</b> 10.6–10.11	Intel x86 processor 512 MB of RAM 200 MB hard drive space	Pentium 4 or newer processor 2+ GB RAM 80+ GB hard drive
<b>Linux</b> Fedora 19, 20, 21, 22 openSUSE 13.1 Red Hat Enterprise Linux 6.5 Ubuntu (LTS) 12.04, 14.04	Intel x86 processor 512 MB of RAM 200 MB hard drive space Required libraries/packages: <ul style="list-style-type: none"> <li>• GTK+ 2.18 or higher</li> <li>• GLib 2.22 or higher</li> <li>• Pango 1.14 or higher</li> <li>• X.Org 1.0 or higher (1.7+ recommended)</li> <li>• libstdc++ 4.3 or higher</li> <li>• libreadline6:i386 (required for Ubuntu only)</li> <li>• GNOME 2.16 or higher</li> </ul>	Pentium 4 or newer processor 2 GB RAM 80 GB hard drive Recommended libraries/packages: In addition to the required libraries listed under minimum requirements, the following should be installed: <ul style="list-style-type: none"> <li>• NetworkManager 0.7 or higher</li> <li>• DBus 1.0 or higher</li> <li>• HAL 0.5.8 or higher</li> </ul>

\*This platform is approaching end-of-life; AIR recommends migrating to newer platforms.

## Tablets

[Table 2](#) lists the supported tablets, operating systems, and related requirements. See the *Technical Specifications Manual for Online Testing* for information about configuring these devices for online testing.

Table 2. Supported Tablets and Operating Systems

Supported Operating Systems	Supported Tablets
<b>iOS (iPads)</b> 7.0, 7.1 8.0–8.2 9.x	iPad 2 iPad 3 Fourth-generation (Retina Display) iPad Air iPad Air 2
<b>Android</b> 4.3, 4.4, 5.0, 5.1	Google Nexus 10 Motorola Xoom Samsung Galaxy Note (2014 edition) Samsung Galaxy Tab 3 and 4 LearnPad Quarto
<b>Windows</b> 8.0 (Professional), 8.1, 10 (Educational and Professional)	AIR supports any tablet running these versions of Windows, but has done extensive testing only on Surface Pro, Surface Pro 3, Asus Transformer, and Dell Venue.

## Chromebooks and Chromebases

[Table 3](#) lists the supported operating systems for Chromebooks and Chromebases.



### About Chrome OS and Automatic Updates

AIR recommends turning off or delaying automatic updates of the Chrome operating system. Doing so allows AIR to review changes from Google and address any updates that pose a potential risk to student testing. The recommended period for delaying automatic updates is two weeks.

Automatic update settings are configured in Google's admin console.

Table 3. Supported Chromebooks

Supported Operating Systems	Related Requirements
<b>Chrome OS</b> 41–46	See the <i>Secure Browser Installation Manual</i> for information about installing the secure browser in kiosk mode, a requirement for online testing.

## Thin Clients: NComputing and Terminal Servers for Windows

### *NComputing*

[Table 4](#) lists the supported hardware and software for NComputing solutions.

Table 4. Supported NComputing solutions

Supported Server Host	Supported Server Software	Supported Terminals
Windows 2008 R2	vSpace Server 8	L300

### *Terminal Servers*

[Table 5](#) lists the supported terminal servers for use with a thin client machine.

Table 5. Supported terminal servers

Supported Terminal Servers	Supported Thin Client
Windows Server 2003, 2008, 2012	Any thin client that supports a Windows Server.



#### **Warning: Security Issues with Terminal Services or Remote Desktop Connections to Servers**

Using a terminal services or remote desktop connection to access a Windows Server or workstation that has the secure browser installed is typically not a secure test environment.

## Supported Web Browsers for Online Systems

This section lists the supported web browsers for the 2015-2016 test year. It also addresses AIR's secure browsers for student testing.

### Supported Web Browsers by Operating System

[Table 6](#) lists the supported operating systems and corresponding web browsers for each AIR application. AIR recommends using recent versions of supported web browsers. Each application requires disabling pop-up blocking software and enabling JavaScript. Be sure to use the correct combination of operating system and web browser. For example, Windows 8 requires Internet Explorer 10 or 11.

Table 6. Supported Web Browsers by Operating System

Operating Systems	Browsers	TA Sites, Student Practice Test, THSS	TIDE, ORS
<b>Windows</b>			
XP (SP3)	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
Vista	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
7	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Internet Explorer 10–11	✓	✓
8.0 RT	Internet Explorer 10–11	✓	
8.0 (Professional), 8.1	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Internet Explorer 11	✓	✓
10 (Educational and Professional)	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Internet Explorer 11	✓	✓
<b>Mac OS X</b>			
10.5 (Intel) <sup>a</sup>	Firefox 10–16	✓	✓
	Safari 5.1.x	✓	✓
10.6	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓

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Operating Systems	Browsers	TA Sites, Student Practice Test, THSS	TIDE, ORS
	Safari 5.1.x	✓	✓
10.7	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Safari 5.1.x, 6	✓	✓
10.8	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Safari 6	✓	✓
10.9	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Safari 7	✓	✓
10.10	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Safari 8	✓	✓
10.11	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
	Safari 9	✓	✓
<b>Linux</b>			
Fedora 19–22	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
openSUSE 13.1	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
Red Hat Enterprise 6.5	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
Ubuntu (LTS) 12.04, 14.04	Chrome 41–46	✓	✓
	Firefox 10–41	✓	✓
<b>iOS</b>			
7.0, 7.1	Safari 7	✓	
8.0–8.2	Safari 8	✓	
9.x	Safari 9	✓	

Operating Systems	Browsers	TA Sites, Student Practice Test, THSS	TIDE, ORS
<b>Android</b>			
4.3, 4.4, 5.0, 5.1	Chrome 41–46	✓	
<b>Chrome OS</b>			
41–46	Chrome 41–46	✓	

<sup>a</sup>This platform is approaching end-of-life; AIR recommends migrating to newer platforms.

## Secure Browsers for Online Testing

[Table 7](#) lists the AIR secure browsers for each operating system. A secure browser must be downloaded and installed on each computer used for student testing. Districts that installed a secure browser with a version older than the versions listed below must uninstall it before installing the secure browser for the 2015-2016 school year. For instructions on downloading and installing the secure browsers, refer to the *Secure Browser Installation Manual*.

Table 7. Secure Browsers by Operating System

Operating Systems	Secure Browser
<b>Windows</b> XP (Service Pack 3), Vista, 7, 8.0 (Professional), 8.1, 10 (Educational and Professional) Server 2003, 2008, 2012	8.0
<b>Mac OS X (Intel)</b> 10.5	6.5
<b>Mac OS X (Intel)</b> 10.6–10.11	8.0
<b>Linux</b> Fedora 19–22 openSUSE 13.1 Red Hat Enterprise 6.5Ubuntu 12.04, 14.04 (LTS)	8.1
<b>iOS (iPads)</b> 7.0, 7.1 8.0–8.2 9.x	AIRSecureTest Mobile Secure Browser
<b>Android</b> 4.3–5.1	AIRSecureTest Mobile Secure Browser

Operating Systems	Secure Browser
Chrome OS 41–46	AIRSecureTest kiosk application

## Delaying Firefox Updates

AIR conducts quality assurance on the most recent Firefox versions for each system except the Student Testing Site (which requires the secure browser). You should wait before installing new versions of Firefox, which could impact system performance. Delaying updates allows AIR time to review changes and verify each system works correctly with the new version.

To learn how to disable auto-updates for Firefox, see <https://support.mozilla.org/en-US/kb/forum-response-turning-auto-update>. You may need to disable auto-updates again after installing a newer version.

## Available Audio Settings by Browser

Some test items play audio files, and some students have the text-to-speech (TTS) accommodation. In either case, the student should be able to adjust the audio settings for those items. Table 8 lists the browsers and their associated capability to modify such settings. Use Table 8 to ensure that you deploy a browser with the required capability.

Table 8. Available Audio Settings by Browser

Operating System	Browser	System Volume	TTS Volume	TTS Pitch	TTS Rate
Windows	Secure browser	Y	Y	Y	Y
	IE 10	N	N	N	N
	IE 11	N	N	N	N
	Chrome	N	N	N	N
	Firefox	N	N	N	N
OS X	Secure browser	Y	Y	Y	Y
	Safari	N	N	N	N
Linux	Secure browser	Y	Y	Y	Y
	Firefox	N	N	N	N
iOS	Mobile secure browser	N	Y*	Y*	Y*
	Safari	N	N	N	N



Operating System	Browser	System Volume	TTS Volume	TTS Pitch	TTS Rate
Android	Mobile secure browser	N	N	N	N
	Chrome	N	N	N	N
Chromebook	Secure browser	N	Y	Y	Y
	Chrome	N	N	N	N

\*Available for mobile secure browser version 3.1 or later.

## Requirements for Peripheral Equipment

This section describes the requirements for peripheral equipment: monitors, screens, keyboards, and headphones.

### Monitors and Screen Display Requirements

All supported computers, laptops, netbooks, and tablets must meet the following requirements.

#### *Screen Dimensions*

Screen dimensions must be 10" or larger (iPads with a 9.7" display are included). This means the following devices are **not** supported:

- Apple iPad Mini
- Google Nexus 7 and similar-sized Android tablets
- Netbooks with screen dimensions smaller than 10"

#### *Screen Resolution*

All devices must meet the following minimum resolution. Larger resolutions can be applied as appropriate for the monitor or screen being used.

- Desktops, laptops, and tablets: 1024 × 768
- Netbooks: 1024 × 600

Depending on the screen size, students may need to use vertical or horizontal scroll bars to view all test-related information. Students may also use the Zoom tool in the online test to enlarge the content on the screen.

## Keyboards

External keyboards are strongly recommended for tablets used for testing, and some states require external keyboards for such devices. Students may use mechanical, manual, and Bluetooth-based keyboards. Some external keyboards have additional “shortcut” buttons that can create security issues. These buttons may allow students to open another application or the tablet’s default on-screen keyboard. AIR strongly cautions against using keyboards that have these shortcut buttons.

### Keyboards with the Android

The Android mobile secure browser requires the secure browser keyboard to disable predictive text. Therefore, any external keyboard that has a shortcut button to open the tablet’s default keyboard is not permitted, as this default keyboard will override the mobile secure browser keyboard.

AIR has determined that the EZOWare Slim Full Size Keyboard contains a shortcut button that opens the default keyboard and should NOT be used with Android tablets.

## Headsets and Headphones

Students may need headphones to listen to audio in online assessments, and may use headsets to record answers to tests. Below are some scenarios that require headphones or headsets.

- Students with the text-to-speech accommodation can use headphones to listen to stimuli or to test items being read aloud.
- Students with the enhanced accessibility accommodation can use headphones along with Job Access with Speech (JAWS®) or other screen reading software to complete online tests.
- Each NComputing terminal must have a USB headphone or headset when used for tests that require students to record or listen to audio.

Test Coordinators should determine how many students will need headphones to ensure that there are enough available at the time of a test.

[Table 9](#) lists the supported headphones and headsets.

Table 9. Supported Headphones and Headsets

Model	Connector	Microphone Included	Hardware
Logitech 390	USB (wired)	Yes	All supported desktops, laptops, and Chromebases with USB port.
Panasonic RP-HT21	XBS	No	All supported desktops, laptops, and Chromebases with XBS port.

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Model	Connector	Microphone Included	Hardware
Logitech analog	3.5 mm	No	iOS, Android tablets with 3.5 mm port.
Plantronics 326	3.5 mm*	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Senheizer PC 151	3.5 mm*	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Plantronics 355	3.5 mm*	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Generic headphones	3.5 mm	No	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Generic headphones	USB (wired)	No	All supported desktops, laptops, and Chromebases with USB port.
*These models have two connectors, one each for headphone and microphone. They require a 3.5 mm headphone splitter when used with a computer having a single speaker-microphone port.			

## Mice

Mice on mobile devices are not supported. Wireless or wired mice on desktops and laptops that are compatible with the operating system are supported.